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<Spot translations>

[Claim 1]

A spark plug comprising:

a center electrode (3) formed from a Ni-alloy;

an insulator (2) covering the periphery of the center electrode (3) so that an end (3a) of the center electrode (3) is exposed;

a fitting piece (1) that is disposed so that an end (2b) of the insulator (2) is exposed and so as to surround the outer peripheral surface of the insulator (2) separated by a gas volume (7), and includes a plug screw (1a) on the outer peripheral surface;

a noble metal tip (51) that is provided at the end (3a) of the center electrode (3) and formed from either one of Ir and Ir alloy; and

a grounded electrode (4) that is fixed to the fitting piece (1) and faces the metal tip (51) separated by a discharge gap (6);

wherein, a length A of the discharge gap (6), a width B of the gas volume (7), a protruding length C of the insulator (2) with respect to the fitting piece (1), an outer diameter D of the plug screw (1a), a tip end diameter G of the noble metal tip (51), and a protruding height H of the noble metal tip (51) with respect to the center electrode (3) are:

$$(10/9) \times A \leq B$$

$$0.9 \leq A(\text{mm})$$

$$B(\text{mm}) \leq 1.5$$

$$1.0 \leq C(\text{mm}) \leq 3.0$$

$$10 \leq D(\text{mm}) \leq 12$$

$$0.6 \leq G(\text{mm}) \leq 0.9$$

$$0.3 \leq H(\text{mm}) \leq 1.0$$

[0022]

[Detailed description of the invention]

A spark plug according to an embodiment of the present invention will be described with reference to FIG. 1 and FIG. 2. Reference numeral 1 in FIG. 1 is a cylindrical fitting piece formed from a metallic material that is heat-resistant, corrosion-resistant, and conductive. The fitting piece 1 includes a plug screw 1a for fixing an engine block (not shown) on an outer periphery of the fitting piece 1. The spark plug according to the embodiment is a small spark plug of which an outer diameter D of the plug screw 1a is 12mm or less. The outer diameter D is 10mm or more because of performance reasons.

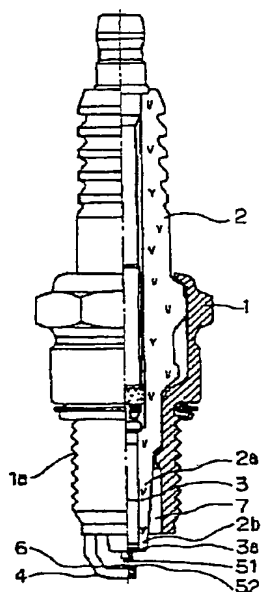
[0028]

The noble metal tip 52 is formed from Pt alloy (Pt-20Ir-2Ni). The tip diameter is 0.9mm, and the height is 0.3mm. The height I of the cylinder 3c of the center electrode 3 is 1.0mm and the diameter J is 1.5mm. Here, the shapes and materials of the noble metal tip 52 and the cylinder 3c of the center electrode 3 are the same with regards to a spark plug for evaluation described below.

[0042]

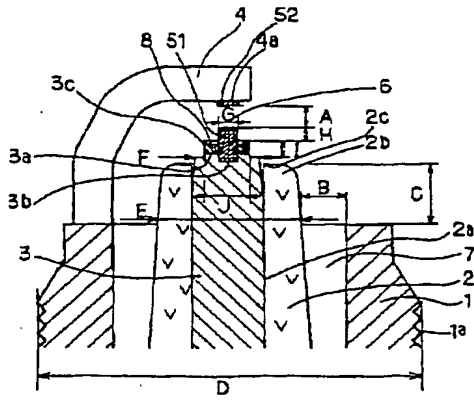
Regarding the noble metal tips 51 of which the respective end diameters G are 0.6mm, 0.9mm, and 1.2mm, the discharge gap A is changed to 0.7mm, 0.9mm, and 1.1mm. The ignitability of the respective spark plugs was evaluated. In addition, a spark plug having the same dimensions as the spark plug used for wear-resistance evaluation was prepared as a comparison product. The ignitability of the comparison product was also similarly evaluated.

Fig. 1



- 1: fitting piece
- 1a: plug screw
- 2: insulator
- 3: center electrode
- 4: grounded electrode
- 51: noble metal tip
- 6: discharge gap
- 7: gas volume

Fig. 2



- 1: fitting piece
- 1a: plug screw
- 2: insulator
- 3: center electrode
- 4: grounded electrode
- 51: noble metal tip
- 6: discharge gap
- 7: gas volume